CITY OF BURLEY WELL #6 (5160008)
SOURCE WATER ASSESSMENT FINAL REPORT

June 17, 2004

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of this designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for City of Burley Well #6 (PWS #5160008)* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The City of Burley drinking water system consists of five ground water sources, referred to as Wells #2, #3, #4, #5, and #6. The previous Source Water Assessment (SWA) report (DEQ, 2002a) included information on Wells #2, #3, #4, and #5. This SWA report covers the updates to the system: namely the addition of Well #6.

A review of the Idaho Drinking Water Information System (DWIMS) and the State Drinking Water Information System (SDWIS) revealed water quality information for the City of Burley drinking water system. Water chemistry tests are routinely conducted on the City of Burley Well #6. Nitrate concentrations have been detected in the samples collected far below the maximum contaminant level (MCL). Contaminants detected in the drinking water system include the IOC fluoride. Again, this constituent was detected at levels far below the MCL. Total coliform bacteria have been detected in the distribution system of this water system. Samples containing total coliform bacteria were collected on 11/8/99 at the employment office, at the Pleasant View Cemetery on 1/24/00, and at the golf course on 4/2/01. It should be noted that these bacteria detections were collected from the distribution system of this drinking water system and are not directly related to the water quality of Well #6. In terms of total susceptibility, the well rated moderate for IOC, VOC, and SOC contamination susceptibility.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous

industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Burley Well #6, drinking water protection activities should focus on maintaining the requirements of the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spills from the potential contaminant sources listed in Table 1 of this report should be carefully monitored, as should any future development in the delineated areas. Most of the designated areas are outside the direct jurisdiction of the City of Burley. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land use areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed drinking water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF BURLEY WELL #6, BURLEY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop this assessment is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of Source Water Quality

The City of Burley Well #6, near Burley, Idaho is located on the southeast edge of the town of Burley (figure 1). The City of Burley Well #6 is one of five wells active for the City of Burley water system that supplies potable water to approximately 8,900 people through 3,150 connections. The susceptibility assessment for City wells #2, #3, #4, and #5 is not included in this report and has been previously conducted through the Department (DEQ, 2002a). This report can be available upon request to the Department.

Water chemistry tests are routinely conducted on the City of Burley Well #6. Nitrate concentrations have been detected in the samples collected far below the maximum contaminant level (MCL). Contaminants detected in the drinking water system include the IOC fluoride. Again, this constituent was detected at levels far below the MCL. Total coliform bacteria have been detected in the distribution system of this water system, though are not associated to Well #6. In terms of total susceptibility, the well rated moderate for IOC, VOC, and SOC contamination.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time-of-travel (TOT) for water associated with the aquifer in the vicinity of the City of Burley Well #6. The computer model used site specific data, assimilated by DEQ from a variety of sources including the City of Burley Well #6 well log and other local area well logs, and hydrogeologic reports summarized below. The delineated source water assessment area for the City of Burley Well #6 can best be described as a wedge shaped area that extends to the east of the source well approximately seven miles. The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Hydrogeology

Well #6 extracts water from basalt of the Snake River Group to the northeast and east and possibly the Idavada Volcanics to the south. The Snake River Group consists of basalt flows with thicknesses ranging from a few to several tens of feet. Contacts between the flows and in rubbly zones are the best water producers. The basalt overlies the Idavada Volcanics.

The Idavada Volcanics unit, locally referred to as rhyolite, consists of welded ash and tuff, rhyolite, and some basalt flows. The flows are dense and are commonly reddish-brown, gray, or black. The tuff and ash beds are fine to coarse grained, light colored, and commonly water laden (Crosthwaite, 1969).

Twenty-four years of records since 1964 set the average yearly rainfall in Burley at 8.6 inches (Crosthwaite, 1969). The Albion Range and the fault zone at its base bound the plain on the southeast and the Rock Creek Hills bound the plain on the southwest. The lowland slopes northward from an

The regional Snake River Group basalts to the east and northeast mainly influenced the City of Burley delineation modeling. However, there was also a southerly component of the flow from the fault zone along the Albion Range. Previous modeling (Garabedian, 1992) in the area was used as a guide.

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are filled primarily with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with sedimentary rocks along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p. 15).

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Southwest Margin of the ESRP hydrologic province is the regional aquifer's primary discharge area. Interpretation of well logs indicates that a 1- to 23-foot-thick layer of sediment overlies the fractured basalt aquifer in Jerome County, and that an 8- to 410-foot-thick layer of sediment overlies the same aquifer in southern Minidoka and Power Counties. Published geologic maps of the Snake River Plain (Whitehead 1992, Plates 1 and 5) indicate there is 100 to 500 feet of Quaternary to Tertiary aged compacted to poorly consolidated sediments located in the Heyburn area (north of the Snake River near Burley). The saturated thickness of the regional basalt aquifer for the Southwest Margin is estimated to range from less than 500 feet near the Snake River to 1,500 feet near Minidoka.

A published water table map of the Kimberly to Bliss region of the aquifer (Moreland, 1976, p. 5) indicates that the ground-water flow direction in the Southwest Margin is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Annual average precipitation for the period 1951 to 1980 is 9.6 inches in both Twin Falls and Burley (Kjelstrom, 1995, p. 3). The estimated recharge from precipitation in the Southwest Margin ranges from less than 0.5 inch to more than 2 in./yr (Garabedian, 1992, p. 20). Kjelstrom (1995, p. 13) reports an annual river loss of 110,000 acre-feet to the aquifer for the 34.8-mile Minidoka-to-Milner reach of

the Snake River. River gains of 210,000 acre-feet for the 21.5-mile Milner-to-Kimberly reach, and 880,000 acre-feet for the 20.4-mile Kimberly-to-Buhl reach are reported for the same period.

The delineated source water assessment area for the City of Burley Well #6 can best be described as a wedge shaped corridor extending to the east of the well. The delineation varies from ½ to 7 miles wide and about 7 miles long. The actual data used by WGI in determining the source water assessment delineation area are available from DEQ upon request

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the City of Burley Well #6 is irrigated agriculture. Land use in the immediate area of the wellhead consists of irrigated agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during April 2004. The inventory involved identifying and documenting potential contaminant sources within the City of Burley Well #6 Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. Additional information regarding the system was provided by the operators in May of 2004 that influenced the overall ranking of the susceptibility of this well.

Twenty-nine potential contaminant sites are located within the delineated source water area (Table 1). The sources are a dairy, an UST site, a mine and a gravel pit located within the 0 to 3-year time-of-travel (TOT) zone. Three dairies, two SARA sites, two AST sites, a LUST site, an UST site, and a group 1 nitrate priority site are located within the 3 to 6-year TOT zone. Six dairies, two mines, a gravel pit, three UST sites, and two group 1 nitrate priority areas are located in the 6 to 10-year TOT zone. The Snake River intersects all of the TOT zones, increasing the potential sites included in the assessment.

Table 1. City of Burley Well #6, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST site – Burley Idaho Terminal	0-3	Database Search	VOC, SOC
2	Dairy (<=200 cows)	0-3	Database Search	IOC, Microbial
3	Mining site –Placer Deposits	0-3	Database Search	IOC, VOC, SOC
4	Gravel Pit	0-3	Database Search	IOC, VOC, SOC
5, 6	LUST site – incomplete site cleanup UST site – closed	3-6	Database Search	VOC, SOC
7	Dairy (<=200 cows)	3-6	Database Search	IOC, Microbials
8	Dairy (<=200 cows)	3-6	Database Search	IOC, Microbials
9	Dairy (<=200 cows)	3-6	Database Search	IOC, Microbials
10	SARA – petroleum station	3-6	Database Search	IOC, VOC, SOC
11,12,13	SARA – petroleum station AST Site AST Site	3-6	Database Search	IOC, VOC, SOC
14	Group 1 -- nitrate	3-6	Database Search	IOC
15	UST site –Ranch (open)	6-10	Database Search	VOC, SOC
16	UST site – Farm (open)	6-10	Database Search	IOC, VOC, SOC
17	UST site – Farm (open)	6-10	Database Search	IOC, VOC, SOC
18	Dairy (<=200 cows)	6-10	Database Search	IOC, Microbials
19	Dairy (<=200 cows)	6-10	Database Search	IOC, Microbials
20	Dairy (<=200 cows)	6-10	Database Search	IOC, Microbials
21	Dairy (<=200 cows)	6-10	Database Search	IOC, Microbials
22	Dairy (<=200 cows)	6-10	Database Search	IOC, Microbials
23	Dairy (201-500 cows)	6-10	Database Search	IOC, Microbials
24	Mining site – Gold	6-10	Database Search	IOC, VOC, SOC
25	Mining site – Gold	6-10	Database Search	IOC, VOC, SOC
26	Gravel pit – State Pit CS 162	6-10	Database Search	IOC, VOC, SOC
27	Group 1 -- nitrate	6-10	Database Search	IOC
28	Group 1 -- nitrate	6-10	Database Search	IOC
29	Snake River	0-10	GIS Search	IOC, VOC, SOC, Microbial

[1] UST = underground storage tank, BLM = Business Mailing List, RCRA = Resource Conservation Recovery Act, SARA = Superfund Amendments and Reauthorization Act sites, AST = above ground storage tank, LUST = leaking underground storage tank, UST = underground storage tank

[2] TOT = time of travel (in years) for a potential contaminant to reach the wellhead

[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was low for the well (see Table 2). This reflects the nature of the ground water shallower than 300 feet bgs, the soils in the delineated area being classified as poorly drained to moderately well to well drained soils, a cumulative aquitard thickness exceeding 50 feet, and the nature of the materials composing the vadose zone being predominately clay, sand, and gravel.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The City of Burley Well #6 extracts ground water for domestic uses. The well system construction score was low for the well. The low ratings are due to the casing extending into a low permeability unit and the highest production interval being more than 100 feet below the static water level. The 2002 sanitary survey (DEQ, 2002b) conducted for the well concluded the system was mostly in compliance with Idaho Rules for Public Drinking Water Systems, IDAPA 16.01.08. The deficiency noted was paint buckets were located inside the well house at the time of the inspection. These buckets were removed at the conclusion of the inspection.

The source well is 650 feet deep and was drilled on 4/21/98. The well is cased with 0.375-inch thick, 24-inch casing from ground surface to 140 feet bgs into black lava. The well also has 0.375-inch thick, 20-inch diameter steel casing to a depth of 453 feet into brown clay. The open interval is 198 feet long, spanning from 453 to 650 feet bgs. The bentonite grout surface seal extends from the surface to 140 feet bgs into black lava. The static water level at the time of completion was 288 feet bgs.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Table 1 of the *Recommended Standards for Water Works* (1997) states that 20-inch and 24-inch steel casing requires a thickness of 0.375 inches and 0.50 inches, respectively. The standards state that screens will be installed and have openings based on sieve analysis of the formation. Standard 3.2.4.1 requires all PWSs to have yield and drawdown tests that last "24 hours or until stabilized drawdown has continued for six hours at 1.5 times" (Recommended Standards for Water Works, 1997) the design pumping rate. Information has been provided for this well that satisfies these requirements.

Potential Contaminant Source and Land Use

The well rated high for IOCs (e.g. nitrates), SOCs (e.g. pesticides), and VOCs (e.g. petroleum products). These ratings reflect the numerous potential contaminant sources located within the delineated area. The well rated low in terms of microbial contamination susceptibility. This low rating is due to the number of potential contaminant sites located within the delineated area.

Final Susceptibility Ranking

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will lead to an automatic high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking.

In terms of total susceptibility, the well ranked moderate for IOCs, VOCs, and SOCs. These ratings are predominantly caused by the presence of potential contaminant sites located within the delineated area. The microbial susceptibility for the well was low. This rating is due primarily to the low system construction rating, the potential contaminant sources located within the delineated area, and the low hydrologic sensitivity rating.

Table 2. Summary of City of Burley Well #6 Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
6	L	H	H	H	L	L	M	M	M	L

[1]H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Microbial contamination has been previously detected in the distribution system of the City of Burley drinking water system. Well #6 currently has no significant contamination problems. The well showed a low susceptibility to microbial contamination. This rating is due to the low scores for system construction and hydrologic sensitivity. The well was rated moderate susceptibility to IOCs, VOCs, and SOCs contamination from nearby potential contaminant sources. This rating is primarily due to the presence of potential contaminant sources located within the delineated area.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the City of Burley Well #6, drinking water protection activities should focus on implementation of practices aimed at fulfilling the requirements of the sanitary surveys. The City of Burley Well #6 should also be diligent about local businesses that are regulated by the various environmental regulations (RCRA, CERCLA, SARA) or those with potential inorganic contaminants. Most of the designated areas are outside the direct jurisdiction of the City of Burley. Partnerships with state and local agencies and industry groups should be established and are critical to success. Disinfection practices should be maintained to reduce the risk of future microbial contamination. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land use areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission and Cassia Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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Attachment A

City of Burley Well #6 Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Public Water System Name:	Burley #6
Public Water System Number:	5160008
Well Number:	1
Date:	4/15/2004
Person Conducting Assessment:	Dennis Owsley

SWA Susceptibility Rating Sheet

Zone IA Susceptability Rating	
Warning: Due to specific conditions found in Zone IA this well has been assigned a High overall susceptability for:	None
This rating is based on: (1)The presence of contaminant sources in Zone IA or (2)The detection of specific SOC/VOC chemicals in the well or (3)The detection of specific IOC chemicals above MCL levels in the well.	
Public Water Systems may petition IDEQ to revise susceptibility rating based on elimination of contaminant sources or other site-specific factors.	

Community and Noncommunity-Nontransient Sources	**IOC Score**	**SOC Score**	**VOC Score**
Hydrologic Sensitivity Score =	1	1	1
Potential Contaminant Source/Land Use Score X 0.20 =	6	6	5
Source Construction Score =	0	0	0
Total	**6**	**7**	**6**

FINAL WELL RANKING

IOC Ranking is Moderate (6 to 12 points)

SOC Ranking is Moderate (6 to 12 points)

VOC Ranking is Moderate (6 to 12 points)

Microbial Susceptability Rating		Score
Hydrologic Sensitivity Score =		1
Potential Contaminant Source/Land Use Score X 0.375 =		3
Source Construction Score =		0
Total		5
FINAL WELL RANKING		
Microbial Ranking is Low (0 to 5 points)		

	Public Water System Name:	Burley #6				
	Public Water System Number:	5160008				
	Well Number:	1				
	Date:	4/15/2004				
	Person Conducting Assessment:	Dennis Owsley				
	Source Construction Worksheet					
(1)	Well Drill Date	Input Date	April 21, 1998			
(2)	Well Drillers Log Available?	(•) Yes	( ) No			
				Year		
(3)	Sanitary Survey Available? If Yes, for what year?	(•) Yes	( ) No	2002		
					Value	
(4)	Are current IDWR well construction standards being met?		(•) Yes ( ) No		0	
(5)	Is the wellhead and surface seal maintained in good condition?		(•) Yes ( ) No		0	
(6)	Do the casing and annular seal extend to a low permeability unit?		(•) Yes ( ) No		0	
(7)	Is the highest production interval of the well at least 100 feet below the static water level?		(•) Yes ( ) No		0	
(8)	Is the well located outside the 100 year floodplain and is it protected from surface runoff?		(•) Yes ( ) No		0	
		Source Construction Score =			**0**	
	Final Source Construction Ranking =	Low Source Construction Score (0 to 1 point)				

	Public Water System Name:	Burley #6			Version 2.1			
	Public Water System Number:	5160008			5/19/1999			
	Well Number:	1						
	Date:	4/15/2004						
	Person Conducting Assessment:	Dennis Owsley						

Potential Contaminant Source/Land Use Worksheet

	Land Use/Zone IA				IOC Score	VOC Score	SOC Score	Microbial Score
(1)	Land Use (Pick the Predominant Land Type)	Rangeland, Woodland, Basalt			0	0	0	0
(2)	Is Farm Chemical Use High or Unknown? (Answer No if (1) = Urban/Commercial)	(•) Yes	( ) No		**Complete Step 2a**			
2a	Indicate approriate chemical category	[x] IOCs [ ] VOCs [x] SOCs			2	0	2	0
(3)	Are IOC, VOC, SOC, Microbial or Radionuclide contaminant sources Present in Zone IA? OR Have SOC/VOC contaminants been detected in the well? OR have IOC contaminants been detected above MCL levels in the well? If Yes, please check the appropriate chemical	( ) Yes	(•) No	[ ] IOCs [ ] VOCs [ ] SOCs [ ] Microbials				
				Land Use Subtotal	2	0	2	0

	Zone IB							
(4)	Contaminant Sources Present in Zone IB?	(•) Yes	( ) No					
					IOC Score	VOC Score	SOC Score	Microbial Score
	Number of Sources in Zone IB in Each Category?		**# IOC Sources**	4	8	8	8	4
	(List sources by Category up to a Maximum of Four per Category)		**# VOC Sources**	4				
			# SOC Sources	4				
			# Microbial Sources	2				
(5)	Are there Sources of Class II or III Leachable Contaminants in Zone IB?	(•) Yes	( ) No		IOC Score	VOC Score	SOC Score	Microbial Score
	(List Sources up to a Maximum of Four per Category)		**# IOC Sources**	4	4	4	4	0
			# VOC Sources	4				
			# SOC Sources	4				
(6)	Does a Group 1 Priority Area Intercept or Group 1 Priority Site Fall Within Zone IB?	(•) Yes	( ) No	[x] IOCs [ ] VOCs [x] SOCs [ ] Microbials	2	0	2	0
(7)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone IB.	Greater Than 50 % Irrigated Agricultural Land			4	4	4	4
				Zone IB Subtotal	18	16	18	8

	Zone II			IOC Score	VOC Score	SOC Score	Microbial Score
(9)	Are Contaminant Sources Present in Zone II?	◉ Yes ○ No	Complete Step 9a				
9a	What types of chemicals?	☑ IOCs ☑ VOCs ☑ SOCs		2	2	2	0
(10)	Are there Sources of Class II or III Leachable Contaminants in Zone II?	◉ Yes ○ No	Complete Step 10a				
10a	What type of contaminant?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(11)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone II.	Greater Than 50 % Irrigated Agricultural Land		2	2	2	0
			Zone II Subtotal	5	5	5	0

	Zone III			IOC Score	VOC Score	SOC Score	Microbial Score
(12)	Contaminant Sources Present in Zone III?	◉ Yes ○ No	Complete Step 12a				
12a	What types of contaminant?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(13)	Are there Sources of Class II or III Leachable Contaminants in Zone III?	◉ Yes ○ No	Complete Step 13a				
13a	What types of contaminants?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(14)	Is there Irrigated Agricultural Land That Occupies > 50% of Zone III?	◉ Yes ○ No		1	1	1	0
			Zone III Subtotal	3	3	3	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Community and Non-Community, Non-Transient System Contaminant Source/Land Use Score	28	24	28	8

Final Community/NC-NT System Ranking

IOC Score = High Contaminant/Land Use Score (21 to 30 points)

VOC Score = High Contaminant/Land Use Score (21 to 30 points)

SOC Score = High Contaminant/Land Use Score (21 to 30 points)

Microbial Score = Low Contaminant/Land Use Score (0 to 10 points)

	Public Water System Name:	Burley #6					
	Public Water System Number:	5160008					
	Well Number:	1					
	Date:	4/15/2004					
	Person Conducting Assessment:	Dennis Owsley	0				
	Hydrologic Sensitivity Worksheet						
							Value
(1)	Do the soils belong to drainage classes in the poorly drained through moderately well drained categories?		(•) Yes	( ) No			0
(2)	Is the vadose zone composed predominantly of gravel, fractured rock; or is unknown?		( ) Yes	(•) No			0
(3)	Is the depth to first groundwater greater than 300 feet?		( ) Yes	(•) No			1
(4)	Is an aquitard present with silt/clay or sedimentary interbeds within basalt with greater than 50 feet cumulative thickness?		(•) Yes	( ) No			0
			Hydrologic Sensitivity Score =				**1**
	Final Hydrologic Sensitivity Ranking =	Low Hydrologic Sensitivity Score (0 to 1 point)					